

WHAT IS CLAIMED IS:

1. A delivery sheath for a medical device, the delivery sheath comprising:

an elongate tube having a proximal end and a distal end; and
a resealable longitudinal joint.

2. The delivery sheath of claim 1, the longitudinal joint further comprising:

a first side and a second side;

the first side including a protrusion having a neck leading to

5 a head, the head being larger than the neck; and

the second side including an opening leading to a cavity, the opening being smaller than the head of the first side and at least as large as the neck of the first side, and the cavity being within a range of slightly smaller to larger than the head of the first side.

3. The sheath of claim 1, further comprising:
a single lumen.

4. The sheath of claim 3, wherein:
the longitudinal joint extends throughout an entire length of the sheath.

5. The sheath of claim 3, wherein:

the longitudinal joint extends from a proximal end of the sheath to a position proximal a distal end of the sheath.

6. The sheath of claim 5, wherein:

the longitudinal joint extends distally to a position between 20 and 40 centimeters proximal a distal end of the sheath.

7. The sheath of claim 3, wherein:

the longitudinal joint has a depth extending from an external surface of the sheath to a surface of the lumen.

8. The sheath of claim 3, wherein:

the lumen is capable of being pressurized up to and over 8 atm.

9. The sheath of claim 1, further comprising:

at least a first lumen and a second lumen.

10. The sheath of claim 9, wherein:

the longitudinal joint extends an entire length of the sheath.

11. The sheath of claim 9, wherein:

the longitudinal joint extends from a proximal end of the sheath to a position proximal a distal end of the sheath.

12. The sheath of claim 11, wherein:
the longitudinal joint extends distally to a position between 20 and 40 centimeters proximal the distal end of the sheath.

13. The sheath of claim 9, wherein:
the longitudinal joint has a depth extending from an external surface of the sheath to a surface of the first lumen.

14. The sheath of claim 9, wherein:
the first lumen is capable of being pressurized up to and over 8 atm.

15. A delivery sheath for a medical device, the delivery sheath comprising:
an elongate tube having a proximal end and a distal end; and
a longitudinal joint.

16. The delivery sheath of claim 15, the longitudinal joint comprising:
a contoured profile having a s-shape.

17. The delivery sheath of claim 15, the longitudinal joint comprising:

a slit located within a section that is thinner than its surrounding areas.

18. The sheath of claim 15, further comprising:
a single lumen.

19. The sheath of claim 18, wherein:
the longitudinal joint extends throughout an entire length of the sheath.

20. The sheath of claim 18, wherein:
the longitudinal joint extends from a proximal end of the sheath to a position proximal a distal end of the sheath.

21. The sheath of claim 18, wherein:
the longitudinal joint has a depth extending from an external surface of the sheath to a surface of the lumen.

22. The sheath of claim 15, further comprising:
at least a first lumen and a second lumen.

23. The sheath of claim 22, wherein:

the longitudinal joint has a depth extending from an external surface of the sheath to a surface of the first lumen.

24. A delivery sheath for an embolic protection device, the delivery sheath comprising:
an elongate tube having at least a first lumen and a second lumen; and
a reduced cross sectional area positioned adjacent the first lumen.

25. The sheath of claim 24, wherein:
the reduced cross sectional area is defined by a groove penetrating an outer surface of the sheath.

26. The sheath of claim 24, wherein:
the first lumen is capable of being pressurized up to and over 8 atm.

27. The sheath of claim 24, further comprising:
a longitudinal joint located between the reduced cross-sectional area and the first lumen and extending therebetween.

28. The sheath of claim 27, wherein:
the longitudinal joint extending from a proximal end of the sheath to a position between 20 and 40 centimeters proximal a distal end of the sheath.

29. A delivery system for delivering medical devices, the delivery system comprising:

a sheath including an elongate tube having at least one lumen extending a length of the sheath and a resealable longitudinal joint;

5 a guide wire distributed throughout the length of the at least one lumen;

a handle disposed at a proximal portion of the sheath;

a device coupling the proximal portion of the sheath to a distal portion of the handle; and

10 a device configured to split the longitudinal joint and to allow the sheath to be removed from the guide wire.

30. The delivery system of claim 29, the splitting device further comprising:

a ring having a lumen, the ring fitting over the sheath; and

5 a plow coupled to a surface defined by the lumen of the ring, a height of the plow being sufficient to extend into the lumen of the sheath and including a distal portion configured to enter and split the longitudinal joint during relative longitudinal movement between the ring and the sheath.

31. The delivery system of claim 29, the splitting device further comprising:

a ring having a lumen, the ring fitting over the sheath; and

5 a blade aligned with a longitudinal axis of the ring and being coupled to the surface of the lumen of the ring, a height of the blade being sufficient to extend into the lumen of the sheath and including a distal edge for cutting the sheath during relative longitudinal movement between the ring and the sheath.

32. The delivery system of claim 31, the ring further comprising:
a guide mandrel coupled to the edge of the blade, the guide
mandrel configured to be positioned within the lumen of the sheath.

33. The delivery system of claim 29, wherein:
the device coupling the proximal portion of the sheath to the
distal portion of the handle is split along the length of the device.

34. A delivery system for delivering medical devices, the delivery
system comprising:
a sheath including an elongate tube having at least one lumen
extending a length of the sheath longitudinal joint;
5 a guide wire distributed throughout the length of the at least
one lumen;
a handle disposed at a proximal portion of the sheath; and
a device coupling the proximal portion of the sheath to a distal
portion of the handle;
10 a device configured to allow the sheath to split and be removed
from the guide wire.

35. The delivery system of claim 34, wherein:
the device coupling the proximal portion of the sheath to the
distal portion of the handle is split along the length of the device.

36. A method for deploying a medical device within a biological body vessel via a delivery system, the delivery system including a sheath having a resealable longitudinal joint, a guide wire distributed throughout a length of the sheath, a handle disposed at a proximal portion of the sheath, a device coupling the proximal
5 portion of the sheath to a distal portion of the handle, and a sheath removal ring, comprising:

introducing the medical device with the delivery system into the body vessel;

10 advancing the medical device to the desired location within the body vessel;

deploying the medical device at the desired location within the body vessel; and

removing the sheath from the guide wire by causing the sheath removal ring to split the sheath along the resealable longitudinal joint.

37. The method of claim 36, deploying the medical device further comprising:

holding the guide wire in a relatively steady position while extracting the sheath proximally relative to the guide wire to expose the medical device.

38. The method of claim 36, removing the sheath further comprising:

detaching the handle from the proximal portion of the sheath;

5 advancing the sheath removal ring distally while holding the guide wire and the sheath in a relatively steady position, thereby splitting the longitudinal joint at the proximal portion of the sheath;

pulling the sheath proximally while holding the sheath removal ring and the guide wire in a relatively steady position until a distal end of the longitudinal joint is external the biological body;

10 removing the sheath removal ring while holding the guide wire in a relatively steady position; and

removing the remainder of the sheath from the guide wire while holding the guide wire in a relatively steady position.

39. The method of claim 36, removing the sheath further comprising:

removing the device coupling the proximal portion of the sheath to the distal portion of the handle.

40. A method for deploying a medical device within a biological body vessel via a delivery system, the delivery system including a sheath having a longitudinal joint, a guide wire distributed throughout a length of the sheath, a handle disposed at a proximal portion of the sheath, a device coupling the proximal portion
5 of the sheath to a distal portion of the handle, and a sheath removal ring, comprising:

introducing the medical device with the delivery system into the body vessel;

advancing the medical device to the desired location within the body vessel;

10 deploying the medical device at the desired location within the body vessel; and

removing the sheath from the guide wire by causing the sheath removal ring to split the sheath along the longitudinal joint.

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41. The method of claim 40, deploying the medical device further comprising:

holding the guide wire in a relatively steady position while extracting the sheath proximally relative to the guide wire to expose the medical device.

42. The method of claim 40, removing the sheath further comprising:

detaching the handle from the proximal portion of the sheath;

advancing the sheath removal ring distally while holding the

5 guide wire and the sheath in a relatively steady position, thereby splitting the longitudinal joint at the proximal portion of the sheath;

pulling the sheath proximally while holding the sheath removal ring and the guide wire in a relatively steady position until a distal end of the longitudinal joint is external the biological body;

10 removing the sheath removal ring while holding the guide wire in a relatively steady position; and

removing the remainder of the sheath from the guide wire while holding the guide wire in a relatively steady position.

43. The method of claim 40, removing the sheath further comprising:

removing the device coupling the proximal portion of the sheath to the distal portion of the handle.

44. A method for deploying a medical device within a biological body vessel via a delivery system, the delivery system including a sheath having at least a first lumen and a second lumen and a reduced cross sectional area positioned adjacent the first lumen, a guide wire distributed throughout a length of the sheath, a
5 handle disposed at a proximal portion of the sheath, and a device coupling the proximal portion of the sheath to a distal portion of the handle:

introducing the medical device with the delivery system into the body vessel;

10 advancing the medical device to the desired location within the body vessel;

deploying the medical device at the desired location within the body vessel; and

removing the sheath from the guide wire by causing the guide wire to tear through the reduced cross sectional area along the length of the sheath.

45. The method of claim 44, deploying the medical device further comprising:

holding the guide wire in a relatively steady position while extracting the sheath proximally relative to the guide wire to expose the medical device.

46. The method of claim 44, removing the sheath further comprising:

detaching the handle from the proximal portion of the sheath;
pulling the sheath proximally while holding the guide wire in
5 a relatively steady position until a distal end of the groove is external the biological body; and

removing the remainder of the sheath from the guide wire while holding the guide wire in a relatively steady position.

47. The method of claim 44, removing the sheath further comprising:

removing the device coupling the proximal portion of the sheath to the distal portion of the handle.

48. A method of manufacturing a sheath having a resealable longitudinal joint comprising a male portion and a female portion, comprising:

extruding a tubular-shape body having the male portion disengaged from the female portion, a tip of the male portion and an outside edge of the female portion being coupled by a membrane;

breaking the membrane to separate the tips of the male portion and the female portion; and

engaging the male portion with the female portion.